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ABSTRACT

The Museum Resource Center in Waterford, New York, is a pullout program where gifted elementary students work on individual projects in science, technology, or the humanities. Students engage in five tasks in developing a museum display: selcting a topic, exploring it in depth, constructing a display to illustrate their findings, demonstrating their display, and communicating the importance of the display. The project is designed to help students take responsibility for their work, increase their ability to use logical inference, and understand methods of inquiry and research. Mechanics of the program (screening, instruction, evaluation, and personnel) are described. Sample forms are appended. (CL)

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UTILIZING THE MJSEUM CONCEPT FOR ACADEMICALLY TALENTED CHILDREN

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Most of the school districts in this country are too small to develop new and/or large programs to deal with any educational problem. The economic facts of life in the 1980's are that diminished and diminishing resources mitigate against the development and continuation of the gifted and talented child or any other child whose educational services are not legally mandated. The Museum Resource Center at the Waterford-Halfmoon Elementary School in Waterford, New York is a functional demonstration of a school district's ability to carry out educationally desirable responsibilities in an age which deems the economically desirable as having a higher priority. The program has received support since 1979 from a combination of federal, state and local resources. It will be continued in 1981 relying on only local resources, having proved its worth and effectiveness during the pilot stages of the program.

Program Description

The Museum Center is a pullout program where children meet at various times during the week to work on individual projects in science, technology, or the humanities. Children are selected on the basis of a combination of ability, achievement, and leadership. These are determined through a variety of tests and observations and combined on a screening grid for selection by a screening team.

In the Museum Center, students engage in a five part process through which they develop a museum display while increasing their own knowledge in a specific scientific, technological or humanities field. The five parts of the process are the selection of the topic, exploration of the topic in depth, construction of a display illustrative of their findings, demonstration of the display as museum curators and/or as a functioning part of the display, and

communication of the importance of the display both orally and in written form.

In the selection phase of the project students may use several sources to assist them in choosing a topic for more in depth work. These may include video-cassette filmstrips, pre-constructed models, objects from the natural environment, photographs, books, magazines, and so on. In exploring the topic, children find out as much as possible about their topic. This may include such things as charting weather finds, studies about rocks and crystals, examining skeletons, observing various physical and chemical properties, and learning how to utilize the computer in their work. In the construction phase of the process, students develop a museum display based upon the topic they have explored in depth. Demonstrating the results of their work may take several forms for the student. They may serve as museum curators, or they may actually conduct a demonstration or prepare a tape on a topic such as Greek mythology. In the final stage, communication, the student may serve as a museum guide to explain and answer questions about the current displays on exhibit as well as taking part in the preparation of the museum's monthly newsletter. This of course, is in addition to the written reports of planning and project completion information.

There are four major objectives the program is attempting to enable students to achieve. They are the ability to take responsibility for one's own work, increased oral and written expression, increased ability to use logical inference, and an understanding of the methods and processes used in investigating our world.

Evaluation

As noted above, there are four goals which the program sets for children: increases in responsibility, understanding of investigative processes, increases in logical inference, and increases in written and oral language. The first year's evaluation (1979-80) is complete at this writing. The current year's evaluation (1980-81) will not be completed for several months. The following description summarizes the evaluation design and findings for the first year of operation.

Understanding of investigative processes and achievement in oral and written language were evaluated through evaluation team observation ratings on a locally developed checklist. These two objectives, as well as the other two, were evaluated using a pretest/posttest design. In the area of understanding scientific processes, 84% of the children enrolled in the program had attained the mastery level set for them; in the area of written and oral language, 80% of the children in the program had attained the mastery level set for them.

Increased achievement in the area of responsibility was measured by the IAR Scale (Crancall, Katkovsky, and Crandall, 1965). A t-test for related samples yielded a non-significant t=.516 with a region of rejection set at $p < .05$ with 22 degrees of freedom. Rather than conclude that the program was not capable of fostering such change and eliminating the objective from consideration, the instructional patterns were revised for the subsequent year.

Increased ability to use logical inference was measured by the Cornell Class Reasoning Test, Form X (Ennis, et al, 1965). A t-test for related samples yielded a significant t-value of t=1.74 ($p < .05$) with 22 degrees of freedom. It was concluded that the program was useful in increasing this ability beyond what would have occurred from normal maturation based upon norms supplied by the test manual.

The Museum Concept

Gifted education research (Renzulli & Smith, 1980) suggests many ways to address the needs of gifted and talented children. Among these are special interest groups, seminars, community mentors, advanced placement for part of the day, tutoring, teaming, resource room centers, and independent study. The Waterford-Halfmoon School District is small (less than 600 elementary students), and its resources are limited. With these limitations in mind, a program had to be chosen which was both cost-effective and appropriate for varied age and grade levels.

The Resource Room concept was seen as the best plan. The missing element in the traditional Resource Room was a means for children to share their unique work with others. It was not the purpose to create a room where children went in and out without anyone knowing what they did or why they did it. The district did not want to promote any idea of isolation. The concept of a student museum evolved and was appealing because it offered a place of many possibilities. First, it would house the products of students' research.

An important aspect of creation is communicating the discoveries and ideas. Students need a place to demonstrate and evaluate their own work. As students share their efforts, they can also learn from each other. The reactions of others can inspire them to work harder, be neater. Also, someone else's project can be the stimulus for a new idea, a new interest, or a new angle of some old information.

In addition to providing a place for intermingling of gifted students of various ages and interests, the Museum also offers opportun-

ities to the whole student body. They too can learn from the projects and, through the use of the "revolving door" (Renzulli & Smith, 1980), can participate in the creation of some new displays. Thus the Museum Resource Center has become a student museum created and produced by the children themselves. It benefits not only the children in the program, but also the whole student body.

The room does function as a museum. It is open all day long, and classes may visit with their teacher at any time. When a teacher is teaching a unit on volcanoes, for example, she may plan an instructional session in the museum to have her class see the volcano display prepared by a museum member. There, the class could see a model of a volcano, the types of rock created by volcanoes, and volcanic ash from Mount St. Helens. The museum offers the teacher an alternative way of presenting curriculum. Departing from the textbook approach can often offer the students an exciting method of learning material. The museum student has also profited from creating the exhibit.

Besides class visits, each classroom also has three individual passes. Children may use these passes to go to the Museum by themselves during the afternoon when they have free time.

Mechanics of the Program - Screening

Screening for the program is done by the project director during the summer. From 1973, the project director has worked with the Saratoga County BOCES to develop a manual for the identification of gifted and talented students. That matrix is used but varied to better suit the needs of this program (See Appendix A).

Many arguments have been voiced concerning the use of a matrix as being too restrictive in the selection process. However, considering the district program size, the plan could not adequately accomodate the number of children who would be referred if only one criterion, for example achievement in reading or mathematics, was used. Through the use of the Renzulli "Revolving Door" plan, students who show exceptional talent in a particular area can be included on a part-time basis.

On the plus side, the matrix takes away the emphasis on a single score or a single opinion as an indicator of giftedness, for example I. Q. There are also, built into the program, several "checks" to pick up children who may be overlooked by this form. In any program, no matter what method is used, some children may well be overlooked, and some children who don't fit into a program may always be included. Thus, one has to be flexible enough to adjust whatever criterion model is used. Any student recommended at any time by a teacher, parent, or another student is reconsidered for the museum. If the student has an interest he would like to pursue, time is scheduled for him to work on that project in the museum. Sometimes these trial periods give an insight into how well the child works in the program.

Instruction

Once the children are selected, they begin working in the Museum Resource Center. Students engage in a five part process through which they develop a museum display. As explained in the slide presentation, those five parts are the selection of a topic, exploration

of the topic in depth, construction of a display illustrative of their findings, demonstration of the display as museum curators, and communication of the importance of the display both orally and in written form.

Students are scheduled for two 45-minute periods per week. One of these periods is a discovery or instructional time with the museum teacher. In small groups, the children may try to solve a logic puzzle, or a math brainteaser, or do some creative problem solving. The other scheduled period is used for individual research or experimentation on a topic of the child's choice. The children work on their own projects with aid from the museum teacher or high school tutors as needed.

In addition to the two scheduled times, children are allowed to work in the museum independently whenever the classroom teacher releases them from classroom time, during snack break, or after school.

Varied types of activities are offered to children in the museum. Some programs stress acceleration while the museum program basically expands the curriculum horizontally through enrichment; that is, it uses the regular curriculum content but addresses more complex objectives. Research indicates that this type of approach allows individual learning at a suitable pace and depth for each student. This integration of classroom curriculum and resource center learning experiences is especially good for brighter children because often they need to see deeper relationships and understand why things are as they are. The child can explore in depth a topic that might have been lightly covered in class. His research benefits his classmates by providing additional

interesting and informative material. It also allows a teacher to be more supportive of a student missing class time since the teacher knows the student is pursuing a curricular objective. This is a component missing from some different types of programs. (See Appendix E for other classroom activities which can be coordinated with the use of gifted children.)

The museum lends itself to an interdisciplinary approach. Last year science was the focal point of the curriculum because of its appeal to children and its many hands-on learning experiences. The aim was to develop language, communication, and logical skills through experiences in the sciences. This year, a mini-grant has enabled the program to expand into the humanities. Thus museum projects now deal with many aspects of the curriculum - - from Greek gods related to a fifth grade unit on Greece, to writing messages in Braille, an outgrowth of a fourth grade study of Helen Keller.

Among the types of activities offered are the following:

A. Planned Studies - These include topics chosen by the museum teacher designed to give children a glimpse of a new topic. One example is the study of hot air balloons. A hot air balloon expert is currently scheduled to speak to the group and demonstrate principles of hot air balloons. The children will engage in various projects related to the history and mechanics of ballooning and will attempt to launch their own hot air balloon.

B. Inquiry Activities - These are high interest activities. The children use brainstorming and trial and error to discover how a particular object

works, or what comprises a mystery solution. The museum teacher prepares a variety of inquiry activities for one of the scheduled museum times each week.

C. Individual Projects - These are exploratory projects related to a child's own interests. The topics may arise from the child's classroom work, family trips, hobbies, a book, a television show, or any variety of activities. The children pursue these individual projects during one of the scheduled periods each week, plus any other time they care to spend in the museum. Times available include snack breaks, after-school periods (3:00 - 3:40), and any other released time from the classroom. This extra time varies with the child according to individual needs.

D. Oral Presentations - Children are encouraged and expected to explain their projects to their own classes and to groups who visit the museum. In addition, children are asked to famiarize themselves with all museum displays so they can serve as guides to visitors.

E. Field Trips - Trips are planned to provide a source of new interests for the child and to help make some comparisons of the school's museum projects with those of other museums. This year the children will visit the Atmospheric Science Research Center at SUNY-Albany, The Dyken Pond Conservation Area in a rural upstate New York area, and several other museums.

F. Speakers - People are invited to talk to the children and acquaint them with special fields. Museum staff members from area museums are also welcomed to make presentations on the construction of museum exhibits and to offer constructive criticisms of the students' own displays.

G. Writing - The children must learn effective ways of communicating information through various written forms. They must learn which form is most appropriate for each display. Several sixth grade students also prepare a monthly newsletter for teachers. The newsletter describes current projects and offers student-designed math puzzles and brain-teasers. Teachers use these guides to prepare their classes for museum visits.

Project Planning and Evaluation

The children are acquainted with various ways of planning their projects. One is a simple outline (See Appendix B). The children are encouraged to utilize other sources besides the encyclopedia. For example, students are taught the value of an interview with an expert. They learn how to do surveys, write letters to appropriate sources, and evaluate outcomes.

Once a project is completed, it is placed on display in the museum. The child completes a self-evaluation form answering questions about his exhibit. Then he is encouraged to select a student to also evaluate the project. The museum teacher is a facilitator who points out the strengths of a display and helps the student identify weak areas. She then helps the child to formulate a plan of action for improving on those weak areas in the next project.

Often, children will encounter another type of evaluative feedback from museum visitors. If the student sees that people do not understand how to operate his experiment, he realizes the need to clarify directions, to be more explicit. Often, this type of evaluation is extremely effective.

Museum Personnel

There are several people involved in this project. The project director and the associate director are the creators of the museum and oversee its direction. The director conducts preliminary screening of the children during the summer. Final selection is done by the school's Committee for Gifted Children in the fall. The program director also hires the museum teacher, helps with the scheduling, orders materials, and maintains the budget records. The associate director is primarily responsible for the evaluation phases of the program.

The museum teacher works four half-days each week. The children are scheduled for classes during these times. There are 28 full-time students in the program. This represents close to 5% of the elementary population. In addition, the "talent pool" covers the top 25% of the student body. By using Renzulli's "Revolving Door" model, the museum teacher is able to include a large number of students in the program for short periods of time.

The museum teacher has responsibilities as outlined in the job description for the position (See Appendix C).

One important responsibility is communication. This is the key to keeping this program operating smoothly. Parents receive a monthly report which indicates projects completed by their child. If there are related activities in the area pertaining to the child's projects, this information is also expressed. Once a month, the Museum has late hours so that working parents may visit.

Teachers also receive a monthly progress report (See Appendix D). There is a space for the teacher to indicate topics for future study.

This helps the museum teacher to coordinate the museum work with the child's classroom experiences. It also helps the classroom teacher to keep aware of her students' progress in the Museum Resource Center.

A P P E N D I C E S

A. Identification Matrix

B. Planning My Project (Student)

C. Museum Teacher Responsibilities

D. Monthly Progress Report (Teacher's)

E. Team Learning Demonstration

APPENDIX A

Grades 3 - 6 IDENTIFICATION MATRIX Date of Information Gathering_____

NAME_____ HOMEROOM TEACHER_____ GRADE_____

Indicate in proper parenthesis, the exact score for tests given.

	SCORES				
	5 points	4 points	3 points	2 points	1 point
1. Standardized intelligence test	130+ ( )	125-129 ( )	120-124 ( )	115-119 ( )	105-114 ( )
2. Standardized reading test	95% ( )	90-94% ( )	85-89% ( )	80-84% ( )	75-79% ( )
3. Standardized math test	95% ( )	90-94% ( )	85-89% ( )	80-84% ( )	75-79% ( )
4. Standardized language test	95% ( )	90-94% ( )	85-89% ( )	80-84% ( )	75-79% ( )
5. PEP Reading	95% ( )	90-94% ( )	85-89% ( )	80-84% ( )	75-79% ( )
6. PEP math	95% ( )	90-94% ( )	85-89% ( )	80-84% ( )	75-79% ( )
7. MET-Achievement-Science	95% ( )	90-94% ( )	85-89% ( )	80-84% ( )	75-79% ( )
8. MET-Achievement-Social Studies	95% ( )	90-94% ( )	85-89% ( )	80-84% ( )	75-79% ( )
9. Learning Scale	20 ( )	16-19 ( )	10-15 ( )	5-9 ( )	0-4 ( )
10. Creativity Scale	20 ( )	16-19 ( )	10-15 ( )	5-9 ( )	0-4 ( )
11. Leadership Scale	20 ( )	16-19 ( )	10-15 ( )	5-9 ( )	0-4 ( )
12. Teacher Recommendation					

Total Number of Points_____

APPENDIX B

Planning My Project (Student)

Name:_____ Date:_____

Topic:_____

What I know about this subject:

What I would like to find out:

Information scources:

People to Interview: Time:

Product:

Other possible products:

APPENDIX C

Museum Teacher's Responsibilities

RESPONSIBILITIES OF THE MUSEUM TEACHER

1. Develop an Individualized Educational Plan (IEP) for each child. The plan will include year long objectives to provide continuity throughout the year and during subsequent years.
2. Provide instruction in scientific and logical processes.
3. Provide materials and projects for students at the appropriate ability level.
4. Monitor the child's progress and facilitate follow-through of projects.
5. Plan field trips to other museums and places of interest.
6. Provide speakers on appropriate topics.
7. Report monthly to parents.
8. Report monthly to teachers.
9. Schedule an "Open House" once a month for parents, community members, and the Board of Education (i.e. evening hours).
10. Attend workshops and conventions.

APPENDIX D

Monthly Progress Report (Teacher's)

MUSEUM RESOURCE CENTER
MONTHLY PROGRESS REPORT TO TEACHERS

Student's Name_____ Grade_____

Teacher_____

Projects completed this month:

Projects in progress:

	Outstanding	Satisfac-tory	Needs to improve	Comments
Completes projects				
Neatness of work				
Takes care of materials				
Uses time wisely				
On time for classes				
Behavior in center				
Clean-up				
Attitude				

- -

Teachers,
Please check the appropriate box.

Shares projects with the class. _____yes _____no

Completes assigned classwork. _____yes _____no

- -

Please indicate classroom work which may be correlated with a future Museum project. This can be a topic you have already done or will be doing in the futute.

_____

_____

Initials of teacher:_____

APPENDIX E

Team Learning (Learning Circles)

Team learning is useful for teaching and introducing new material.

Procedure:
1. The teacher presents material(s) to be learned. These may be a reading, a filmstrip, movie, or a sheet of written text. Along with the material, a sheet of questions, both convergent and divergent, is provided to each student.

2. Students form groups of five to eight (using either student self-selection or teacher selection).

3. Each group selects, elects, appoints, etc. a recorder to write down the responses to questions.

4. Any member of a team can help any other member of the same team, but not a member of another team.

5. Either a longer term assignment (for independent work periods) or a forced time limit may be used.

6. Recorders for each of the groups report to the whole class.

This procedure leaves the teacher free to conduct several alternatives or roles within the classroom:

a. Using exceptionally talented children (in specific areas) to serve as consultants to various groups.

b. The teacher can conduct concrete or graphic presentations of the material to selected groups or students. Or, the teacher may provide the alternative presentation to each of the groups, one at a time. Or, the teacher may use a particularly talented student to conduct these mini-lecture-demonstrations.

c. The teacher (or exceptional student) can circulate from group to group either as an observer (of thought process, group interaction, etc.), or as an observer/participant, or as a teacher when activity has been halted. Members should not leave a group to go to get the teacher; rather, they should simply put their group number on the board under the "teacher written" heading of "We need help."

TEAM LEARNING EXERCISE

by

Walter Sawyer
and
Carolyn Snapp

The "Team Learning Exercise" requires participants to read two pages of text prior to completing the material on page 20. The two pages used for this exercise are pages three and four of Realms of Meaning (Phenix, 1964).

TEAM LEARNING GROUP DEMONSTRATION ASSIGNMENT: The Argument (Phenix, 1964)

A. Team members: 1._____ 2._____

3._____ 4._____ 5._____

B. What is education used to perpetuate?_____

C. Name two individuals who tend to view specific aspects of the curriculum without relating them to other aspects of the curriculum:

1._____

2._____

D. What is meant by a "philosophy of curriculum?"_____

_____

_____

E. Give at least three one-sentence reasons why a "philosophy of curriculum" is necessary:

1._____

2._____

3._____

4._____

F. List five ways in which reading and science can be related in the elementary and/or secondary curriculum:

1._____

2._____

3._____

4._____

5._____

G. On the back of this paper, develop a one paragraph rationale stating why the separate subject disciplines currently found in most American high schools should be eliminated and replaced with a one-subject program called "Education for Life."

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